CLAIMS

1. A frequency tunable oscillator comprising a negative resistance element and a resonator together forming a feedback circuit, and further comprising, in at least a part of the feedback circuit, a distributed constant material so configured as to have a distributed constant such that an electrical length in the resonator is modulated and a modification means for externally modifying the distributed constant material, wherein the oscillation frequency is allowed to vary through the external modification by the modification means.

2. The frequency tunable oscillator according to claim 1, wherein the distributed constant material comprises a liquid crystal, and the modification means performs electric field control for changing the orientation of liquid crystal molecules as an external modification.

3. The frequency tunable oscillator according to claim 1, wherein the distributed constant material comprises electrophoretic particles, and the modification means performs electric field control for changing the spatial distribution of the electrophoretic particles as the external modification.

4. The frequency tunable oscillator according to claim 1, wherein the distributed constant material

comprises a bimetal alloy, and the modification means performs thermal control for changing the shape of the bimetal alloy as the external modification.

5. The frequency tunable oscillator according to claim 1, wherein the resonator comprises a microstrip resonator formed by cutting a high frequency transmission line into a finite length.

6. The frequency tunable oscillator according to claim 5, wherein the high frequency transmission line is electromagnetically coupled to the microstrip resonator, and an oscillation output is taken into an outside circuit.

7. The frequency tunable oscillator according to claim 1, wherein the negative resistance element is a resonant tunneling diode based on photon-assisted tunneling.

8. A sensing apparatus comprising the frequency tunable oscillator set forth in claim 1, wherein an electromagnetic wave outputted from the frequency tunable oscillator is lead into an analyte, and an electromagnetic wave from the analyte carrying an information to the analyte is detected by a detection means.